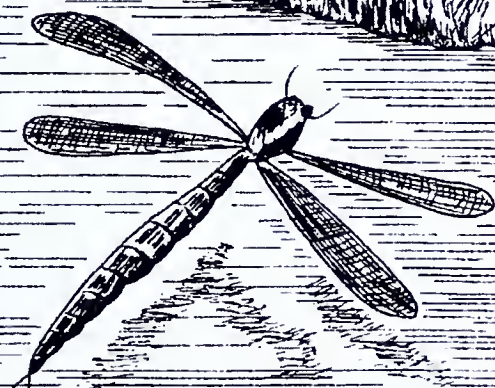


PENNSYLVANIA GEOLOGICAL PUBLICATIONS



DCNR

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND ENGINEERING SERVICES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY

October 2001

PENNSYLVANIA GEOLOGICAL PUBLICATIONS

Compiled by Caron O'Neil and Anne B. Lutz
Pennsylvania Geological Survey

COVER: A typical scene of a Pennsylvanian-age coal swamp. Such swamps were common throughout much of Pennsylvania about 300 million years ago. Vegetation accumulated, was buried, and later was converted to the bituminous and anthracite coal beds mined in Pennsylvania today. The ancestral dragonfly in the foreground had a wingspread of about 2 feet. Drafted by John G. Kuchinski.

PENNSYLVANIA GEOLOGICAL SURVEY

FOURTH SERIES

HARRISBURG

2001 (Includes updates as of October 2001 to all publications.)

PENNSYLVANIA GEOLOGICAL PUBLICATIONS

Compiled by David H. Rye and John E. Fair
Geological Survey of Pennsylvania

Over a period of nearly 100 years, the Pennsylvania Geological Survey has been a leading agency in the study of the geology of the Commonwealth. The Survey has been instrumental in the discovery and development of the State's natural resources, and in the advancement of the science of geology. The Survey has also been a leading agency in the study of the geology of the Commonwealth, and in the advancement of the science of geology.

PENNSYLVANIA GEOLOGICAL SURVEY

FOURTH SERIES

NUMBER 311

2001. *Geological Survey of Pennsylvania*

CONTENTS

	<i>Page</i>
How to order publications	1
How to obtain topographic maps of Pennsylvania	1
The geological surveys of Pennsylvania	1
Sources of out-of-print reports	2
Bibliographies of Pennsylvania geology	2
Map scales	2
Format, symbols, and abbreviations	2
List of publications	3
Pennsylvania Geological Survey, fourth series	3
Atlas Series	3
County Reports	7
Educational Series	8
Environmental Geology Reports	8
General Geology Reports	9
Information Circulars	12
Maps	15
Mineral Resource Reports	17
Miscellaneous Papers	22
Open-File Reports	22
Park Guides	26
Progress Reports	27
Special Bulletins	31
Special Publication	32
Water Resource Reports	32
Selected Publications	35
Pennsylvania Topographic and Geologic Survey Commission	36
Economic Reports	36
Biennial Reports	36
Map showing location of areal reports	37
Map of quadrangle numbering system	38
Quadrangle index	38
Index to publications on Pennsylvania	43
County index	43
Subject index	46



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HOW TO ORDER PUBLICATIONS

Unless otherwise noted, **free publications** and **open-file reports** may be obtained from:

Department of Conservation and Natural Resources
Bureau of Topographic and Geologic Survey
P. O. Box 8453
Harrisburg, PA 17105-8453
717-787-2169
<<http://www.dcnr.state.pa.us/topogeo/>>

Other publications may be purchased over the counter or by mail from:

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Commonwealth Keystone Building
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Harrisburg, PA 17120-0053
717-787-5109

Orders sent to the State Bookstore should include \$4.00 postage for the first publication and \$0.50 for each additional publication. Add **6 percent state sales tax** to the price of all publications purchased over the counter or mailed to a Pennsylvania address (tax does not apply to shipping and handling charges). If an order is to be mailed to a foreign address, there will be an additional charge for postage and handling; please call the State Bookstore for details. Make check or money order payable to **Commonwealth of Pennsylvania**. VISA and MasterCard are also accepted, as are orders by telephone. If desired, an invoice can be sent. Stamps will not be accepted as payment. Order forms are included at the back of this book for your convenience.

HOW TO OBTAIN TOPOGRAPHIC MAPS OF PENNSYLVANIA

Topographic maps of Pennsylvania are prepared by the U.S. Geological Survey in cooperation with the Pennsylvania Bureau of Topographic and Geologic Survey. Persons wishing to know the names and scales of topographic maps that are available for Pennsylvania should refer to **Pennsylvania—Index to Topographic and Other Map Coverage**. Names, dates, and prices of maps currently available are listed in **Catalog of Topographic and Other Published Maps**. Both of these publications are free upon request from either of the following agencies:

Department of Conservation and Natural Resources
Bureau of Topographic and Geologic Survey
P. O. Box 8453
Harrisburg, PA 17105-8453
717-787-2169
<<http://www.dcnr.state.pa.us/topogeo/>>

U.S. Geological Survey Information Services
P. O. Box 25286
Denver, CO 80225
1-800-435-7627
<<http://www.usgs.gov>>

Topographic maps may be purchased from the U.S. Geological Survey at the address listed in the right-hand column above. Ordering information and order forms are included in **Catalog of Topographic and Other Published Maps**.

THE GEOLOGICAL SURVEYS OF PENNSYLVANIA

There have been four geological surveys of Pennsylvania and four resulting series of publications:

First Survey, 1836–1842: Publications—6 annual reports, 2 quarto-volumes, and a state geologic map.

Second Survey, 1874–1889: Publications—81 volumes, 35 atlases, and 6 grand atlases.

Third (Commission) Survey, 1899–1914: Publications—6 biennial reports and 12 economic reports, some of which are listed in this book.

Fourth Survey, 1919– : Most publications (fourth series) are listed in this book. The list does not include superseded or replaced reports that are out of print.

All reports of the first three geological surveys and some of the reports of the present (fourth) survey are out of print.

SOURCES OF OUT-OF-PRINT REPORTS

Many reports appearing in this list of publications are marked with an asterisk (*), indicating that they are out of print and no longer available for distribution. Some reports are marked with a dagger (†), indicating that they are temporarily out of print and that new editions are in preparation. Out-of-print reports are available for study in many libraries throughout the state (see list on inside front cover).

The library of the Bureau of Topographic and Geologic Survey, Second Floor, Evangelical Press Building, 1500 N. Third Street, Harrisburg, telephone 717-783-8077, is open for public use and contains most of the Pennsylvania Survey reports, as well as many of the U.S. Geological Survey and other governmental and institutional reports related to Pennsylvania.

BIBLIOGRAPHIES OF PENNSYLVANIA GEOLOGY

For a more comprehensive, annotated listing of publications dealing with Pennsylvania geology through 1979, including journal articles and nongovernmental publications, please refer to the following General Geology Reports published by the Bureau of Topographic and Geologic Survey: **G 34**, **G 42**, **G 61**, and **G 73**, listed on pages 10, 11, and 12 of this book.

For a complete listing of U.S. Geological Survey publications on the geology and water resources of Pennsylvania from 1879 to 1988, refer to **List of U.S. Geological Survey Geologic and Water-Supply Reports and Maps for Pennsylvania and New Jersey**. This publication may be purchased from U.S. Geological Survey Information Services, P. O. Box 25286, Denver, CO 80225, telephone 303-202-4700. The price is \$2.50 plus \$3.50 for shipping and handling; please make check payable to *U.S. Geological Survey*.

MAP SCALES

Common map scales referred to in the list of publications and their equivalent distances are as follows:

SCALE	EQUIVALENT DISTANCE	SCALE	EQUIVALENT DISTANCE
1:6,000	1 inch = 500 feet	1:125,000	1 inch = approx. 2 miles
1:12,000	1 inch = 1,000 feet	1:250,000	1 inch = approx. 4 miles
1:16,000	1 inch = 1,333 feet	1:500,000	1 inch = approx. 8 miles
1:24,000	1 inch = 2,000 feet	1:380,160	1 inch = 6 miles
1:48,000	1 inch = 4,000 feet	1:1,000,000	1 inch = approx. 16 miles
1:50,000	1 inch = 4,167 feet	1:2,000,000	1 inch = approx. 32 miles
1:62,500	1 inch = approx. 1 mile	1:2,500,000	1 inch = approx. 40 miles

Other map scales cited in the list are followed by their equivalent distances.

FORMAT, SYMBOLS, AND ABBREVIATIONS

The list of publications is arranged by series of reports in alphabetical order. Within each series, the reports are listed in numerical order. In the three-column format, the left column indicates the report series and number. The middle column contains bibliographic information such as the title, author(s), year of publication, number of pages, and number of plates. Also included in this column are notations of bedrock and surficial geologic maps, economic geologic maps, and other maps of particular interest, as well as the scales of the maps. The right column contains information on the printing status of each report and prices of reports that are in print. The abbreviations and symbols used in the right column are as follows:

ABBREVIATION OR SYMBOL	MEANING
*	Out of print (see "Sources of Out-of-Print Reports" at the top of this page)
†	Temporarily out of print; new edition in preparation

LIST OF PUBLICATIONS

PENNSYLVANIA GEOLOGICAL SURVEY

Fourth Series

ATLAS SERIES

(Map scale 1:24,000 unless otherwise indicated.)

A 5	New Castle quadrangle—Geology and mineral resources (Bessemer, New Castle South, New Galilee, and Beaver Falls 7.5-minute quadrangles, Lawrence and Beaver Counties), F. W. DeWolf. 1929. 238 p., 18 pls., bedrock geol. map, surficial geol. map, econ. geol. map, scale 1:62,500	*
A 27	Geology and mineral resources of the Pittsburgh quadrangle, Pennsylvania (Pittsburgh East, Braddock, Glassport, and McKeesport 7.5-minute quadrangles, Allegheny and Westmoreland Counties), M. E. Johnson. 1929; 3rd printing, 1974. 236 p., 33 pls., geol. map, min. resource map, scale 1:62,500	*
A 33a	Geology and mineral resources of the Oil City quadrangle, Venango County, Pennsylvania , A. N. Ward, Jr., M. T. Lukert, and W. F. Chapman. 1979. Geol. map and text on 1 pl.	6.00
A 36	Freeport quadrangle—Geology and mineral resources (Freeport, Leechburg, New Kensington East, and Vandergrift 7.5-minute quadrangles, Armstrong, Westmoreland, Allegheny, and Butler Counties), H. H. Hughes. 1933. 272 p., 9 pls., geol. map, scale 1:62,500	2.50
A 37	Mineral resources of the Greensburg quadrangle, Westmoreland County, Pennsylvania (Murrysville, Slickville, Irwin, and Greensburg 7.5-minute quadrangles), M. E. Johnson. 1925; 3rd printing, 1974. 162 p., 13 pls., geol. map, econ. geol. map, scale 1:62,500	*
A 48	Geology and mineral resources of the Donegal quadrangle, Pennsylvania (Mammoth, Stahlstown, Donegal, and Seven Springs 7.5-minute quadrangles, Westmoreland, Fayette, and Somerset Counties), M. N. Shaffner. 1963. 116 p., 4 pls., geol. map, coal reserve maps, scale 1:62,500	4.00
A 54	Geology and mineral resources of the Brookville quadrangle, Pennsylvania (Corsica, Brookville, Summerville, and Coolspring 7.5-minute quadrangles, Jefferson and Clarion Counties), C. K. Graeber and R. M. Foose. 1942; 3rd printing, 1974. 136 p., 16 pls., geol. map, min. resource map, scale 1:62,500	*
A 55	Geology and mineral resources of the Smicksburg quadrangle, Pennsylvania (Dayton, Valier, Plumville, and Marion Center 7.5-minute quadrangles, Jefferson, Indiana, and Armstrong Counties), M. N. Shaffner. 1946; 2nd printing, 1969. 252 p., 11 pls., geol. map, min. resource map, scale 1:62,500	10.50
A 57	Geology and mineral resources of the New Florence quadrangle, Pennsylvania (Bolivar, New Florence, Wilpen, and Rachelwood 7.5-minute quadrangles, Indiana, Westmoreland, Cambria, and Somerset Counties), M. N. Shaffner. 1958. 165 p., 13 pls., geol. and min. resource map, scale 1:62,500; coal reserve maps, scale approx. 1:84,000 (1 in. = approx. 1.3 mi)	6.00
A 64	Geology and mineral resources of the Hazen, Falls Creek, Reynoldsville, and DuBois quadrangles, Clearfield and Jefferson Counties, Pennsylvania , A. D. Glover and W. A. Bragonier. 1978. 131 p., 16 pls., geol. map, scale 1:24,000; coal resource maps, scale 1:48,000	25.00
A 65	Geology and mineral resources of the Punxsutawney quadrangle, Pennsylvania (Punxsutawney, McGees Mills, Rochester Mills, and Burnside 7.5-minute quadrangles, Jefferson, Indiana, and Clearfield Counties), G. H. Ashley. 1926; 2nd printing, 1969. 145 p., 6 pls., geol. map, min. resource map, scale 1:62,500	8.50

A 74ab	Geology and mineral resources of the Sabula and Penfield quadrangles, Clearfield, Elk, and Jefferson Counties, Pennsylvania , T. M. Berg and A. D. Glover. 1976. 98 p., 10 pls., geol. map, scale 1:24,000; coal reserve map, foundation and excavation map, scale 1:48,000.....	22.00
A 74cd	Geology and mineral resources of the southern half of the Penfield 15-minute quadrangle, Pennsylvania (Luthersburg and Elliott Park 7.5-minute quadrangles, Clearfield County), W. E. Edmunds and T. M. Berg. 1971; 2nd printing, 1973. 184 p., 22 pls., geol. map, scale 1:24,000; coal reserve maps, foundation and excavation map, scale 1:48,000.....	10.00
A 75	Geology and mineral resources of the Curwensville quadrangle (Mahaffey, Curwensville, Westover, and Irvona 7.5-minute quadrangles, Clearfield County), G. H. Ashley. 1940; 3rd printing, 1974. 140 p., 4 pls., geol. map, min. resource map, scale 1:62,500	7.00
A 84cd	Geology and mineral resources of the southern half of the Clearfield 15-minute quadrangle, Pennsylvania (Clearfield and Leontes Mills 7.5-minute quadrangles, Clearfield County), A. D. Glover. 1970; 2nd printing, 1973. 139 p., 15 pls., geol. map, scale 1:24,000; coal reserve maps, foundation and excavation map, scale 1:48,000	9.00
A 85ab	Geology and mineral resources of the northern half of the Houtzdale 15-minute quadrangle, Pennsylvania (Glen Richey and Wallacetown 7.5-minute quadrangles, Clearfield County), W. E. Edmunds. 1968; 2nd printing, 1973. 150 p., 15 pls., geol. map, scale 1:24,000; coal reserve maps, scale 1:48,000	8.00
A 85cd	Geology and mineral resources of the Ramey and Houtzdale quadrangles, Clearfield and Centre Counties, Pennsylvania , G. B. Glass, W. E. Edmunds, V. C. Shepps, and others. 1977. 94 p., 10 pls., geol. map, scale 1:24,000; coal resource maps, foundation and excavation map, scale 1:48,000	22.00
A 86	Geology and mineral resources of the Blandburg, Tipton, Altoona, and Bellwood quadrangles, Blair, Cambria, Clearfield, and Centre Counties, Pennsylvania , R. T. Faill, A. D. Glover, and J. H. Way. 1989. 209 p., 10 pls., bedrock geol. map, scale 1:24,000; surficial geol. map, coal resource maps, scale 1:48,000.....	34.00
A 95a	Geology and mineral resources of the Philipsburg 7½-minute quadrangle, Centre and Clearfield Counties, Pennsylvania , G. B. Glass. 1972. 241 p., 20 pls., geol. map, scale 1:24,000; coal reserve maps, foundation and excavation map, scale 1:48,000	12.00
A 96	Tyrone quadrangle—Geology and mineral resources (Tyrone, Franklinville, Spruce Creek, and Alexandria 7.5-minute quadrangles, Blair, Huntingdon, and Centre Counties), Charles Butts, F. M. Swartz, and Bradford Willard. 1939. 118 p., 14 pls., geol. map, scale 1:62,500	*
A 109a	Bedrock and surficial geology of the McConnellsburg quadrangle, Pennsylvania (Fulton and Franklin Counties), K. L. Pierce. 1966; 2nd printing, 1974. 111 p., 3 pls., bedrock geol. map, surficial geol. map.....	5.00
A 119ab	Geology and mineral resources of northeastern Franklin County, Pennsylvania , S. I. Root. 1971; 3rd printing, 1992. 104 p., 2 pls., geol. map.....	13.50
A 119cd	Geology and mineral resources of southeastern Franklin County, Pennsylvania , S. I. Root. 1968. 118 p., 2 pls., geol. map.....	4.00
A 124a	Geology and mineral resources of the Lock Haven quadrangle, Clinton and Lycoming Counties, Pennsylvania , A. R. Taylor. 1977. Geol. map and text on 1 pl.	6.50
A 126	Geology and mineral resources of the Mifflintown quadrangle, Pennsylvania (Alfarata, McClure, Mifflintown, and Mexico 7.5-minute quadrangles, Juniata,	

	Mifflin, and Snyder Counties), R. R. Conlin and D. M. Hoskins. 1962. 46 p., 2 pls., geol. map.....	6.00
A 127	Geology and mineral resources of the Loysville quadrangle, Pennsylvania (Spruce Hill, Ickesburg, Andersonburg, and Landisburg 7.5-minute quadrangles, Perry, Juniata, and Cumberland Counties), J. T. Miller. 1961. 47 p., 2 pls., geol. map.....	10.50
A 129a	Geology of the Caledonia Park quadrangle area, South Mountain, Pennsylvania (Adams, Cumberland, and Franklin Counties), J. L. Fauth. 1968; 2nd printing, 1992. 133 p., 7 pls., geol. map.....	19.00
A 129c	Geology and mineral resources of the Iron Springs area, Adams and Franklin Counties, Pennsylvania , J. L. Fauth. 1978. 72 p., 1 pl., geol. map....	8.50
A 133cd	Geology and mineral resources of the Salladasburg and Cogan Station quadrangles, Lycoming County, Pennsylvania , R. T. Faill, R. B. Wells, and W. D. Sevon. 1977. 44 p., 2 pls., bedrock geol. map, surficial geol. map.....	13.00
A 134ab	Geology and mineral resources of the Linden and Williamsport quadrangles, Lycoming County, Pennsylvania , R. T. Faill, R. B. Wells, and W. D. Sevon. 1977. 66 p., 2 pls., bedrock geol. map, surficial geol. map.....	15.50
A 136	Geology and mineral resources of the Millerstown quadrangle, Perry, Juniata, and Snyder Counties, Pennsylvania (Beaver Springs, Richfield, Millers-town, and Reward 7.5-minute quadrangles), R. T. Faill and R. B. Wells. 1974. 276 p., 6 pls., geol. map, scale 1:24,000; tectonic and environ. geol. map, scale 1:48,000	27.00
A 137ab	Geology and mineral resources of the northern half of the New Bloom-field quadrangle (Newport and Duncannon 7.5-minute quadrangles, Perry County), J. L. Dyson. 1963. 63 p., 1 pl., geol. map.....	3.00
A 137cd	Geology and mineral resources of the southern half of the New Bloom-field quadrangle, Pennsylvania (Shermans Dale and Wertzville 7.5-minute quad-rangles, Perry and Cumberland Counties), J. L. Dyson. 1967; 2nd printing, 1974. 86 p., 1 pl., geol. map.....	5.00
A 138ab	Geology and mineral resources of the Carlisle and Mechanicsburg quad-rangles, Cumberland County, Pennsylvania , S. I. Root. 1978. Geol. map and text on 1 pl.	*
A 143cd	Geology and mineral resources of the Montoursville North and Hunters-ville quadrangles, Lycoming County, Pennsylvania , R. B. Wells and M. F. Bucek. 1980. 68 p., 2 pls., bedrock geol. map, surficial geol. map.....	15.50
A 144ab	Geology and mineral resources of the Montoursville South and Muncy quadrangles and part of the Hughesville quadrangle, Lycoming, North-umberland, and Montour Counties, Pennsylvania , R. T. Faill. 1979. 114 p., 2 pls., bedrock geol. map, surficial geol. map.....	17.00
A 144cd	Geology and mineral resources of the Allenwood and Milton quadrangles, Union and Northumberland Counties, Pennsylvania , J. D. Inners. 1997. 135 p., 3 pls., bedrock geol. map, surficial geol. map, scale 1:24,000; min. production map, scale 1:48,000	24.00
A 146	Geology and mineral resources of the Millersburg 15-minute quadrangle, Dauphin, Juniata, Northumberland, Perry, and Snyder Counties, Pennsyl-vania (Dalmatia, Pillow, Millersburg, and Elizabethville 7.5-minute quadrangles), D. M. Hoskins. 1976. 38 p., 2 pls., geol. map.....	15.00
A 148ab	Geology and mineral resources of the Harrisburg West area, Cumberland and York Counties, Pennsylvania , S. I. Root. 1977. 106 p., 1 pl., geol. map ..	11.50
A 154cd	Geology and mineral resources of the Washingtonville and Millville quad-rangles, Montour, Columbia, and Northumberland Counties, Pennsyl-vania , J. H. Way. 1993. 51 p., 2 pls., bedrock geol. map, surficial geol. map	15.00

A 157d	Geology, mineral resources and environmental geology of the Palmyra quadrangle, Lebanon and Dauphin Counties , A. R. Geyer. 1970. 46 p., 1 pl., geol. map	3.50
A 164cd	Geology and mineral resources of the Bloomsburg and Mifflinville quadrangles and part of the Catawissa quadrangle, Columbia County, Pennsylvania , J. D. Inners. 1981. 152 p., 2 pls., bedrock geol. map, surficial geol. map	16.50
A 167c	Geology of the Lebanon quadrangle (Lebanon County), A. R. Geyer, Carlyle Gray, D. B. McLaughlin, and J. R. Moseley. 1958. 1 pl., geol. map with text on reverse	2.50
A 167d	Geology of the Richland quadrangle (Lebanon and Lancaster Counties), Carlyle Gray, A. R. Geyer, and D. B. McLaughlin. 1958. 1 pl., geol. map with text on reverse	2.50
A 168	Lancaster quadrangle—Geology and mineral resources (Manheim, Lititz, Columbia East, and Lancaster 7.5-minute quadrangles, Lancaster and Lebanon Counties), A. I. Jonas and G. W. Stose. 1930. 106 p., 23 pls., geol. map, scale 1:62,500.....	*
A 174c	Geology and mineral resources of the Berwick quadrangle, Luzerne and Columbia Counties, Pennsylvania , J. D. Inners. 1978. 34 p., 2 pls., bedrock geol. map, surficial geol. map	14.00
A 177c	Geology and mineral resources of the Womelsdorf quadrangle (Lancaster, Lebanon, and Berks Counties), A. R. Geyer, T. V. Buckwalter, D. B. McLaughlin, and Carlyle Gray. 1963. 96 p., 1 pl., geol. map	3.50
A 177d	Geology and mineral resources of the Sinking Spring quadrangle, Berks and Lancaster Counties, Pennsylvania , D. B. MacLachlan, T. V. Buckwalter, and D. B. McLaughlin. 1975. 228 p., 3 pls., geol. map, scale 1:24,000; tectonic map, scale approx. 1:62,500	20.50
A 178	Geology and mineral resources of the New Holland quadrangle, Pennsylvania (Ephrata, Terre Hill, Leola, and New Holland 7.5-minute quadrangles, Lancaster County), A. I. Jonas and G. W. Stose. 1926; 2nd printing, 1969. 40 p., 7 pls., geol. map, scale 1:62,500.....	4.50
A 187ab	Geology and mineral resources of the Temple and Fleetwood quadrangles, Berks County, Pennsylvania , D. B. MacLachlan. 1979. 71 p., 2 pls., geol. map, scale 1:24,000; environ. geol. map, tectonic map, scale 1:48,000.....	14.50
A 187cd	Geology and mineral resources of the Reading and Birdsboro quadrangles, Berks County, Pennsylvania , D. B. MacLachlan. 1983; revised, 1992. Geol. map and text on 1 pl.	10.00
A 194cd	Geology and mineral resources of the Hickory Run and Blakeslee quadrangles, Carbon and Monroe Counties, Pennsylvania , W. D. Sevon. 1975. 2 pls., bedrock geol. map with text on reverse, surficial geol. map	11.00
A 195ab	Geology and mineral resources of the Christmans and Pohopoco Mountain quadrangles, Carbon and Monroe Counties, Pennsylvania , W. D. Sevon. 1975. 2 pls., bedrock geol. map with text on reverse, surficial geol. map ...	13.00
A 195cd	Geology and mineral resources of the Lehigh and Palmerton quadrangles, Carbon and Northampton Counties, Pennsylvania , J. B. Epstein, W. D. Sevon, and J. D. Glaeser. 1974. 460 p., 4 pls., bedrock geol. map, surficial geol. map	28.00
A 197	Geology of the Precambrian rocks and Hardyston Formation of the Boyertown quadrangle (Manatawny, East Greenville, Boyertown, and Sassa-mansville 7.5-minute quadrangles, Berks, Montgomery, and Lehigh Counties), T. V. Buckwalter. 1959. [15 p.], 1 pl., geol. map	4.00

A 204ab	Geology and mineral resources of the Tobyhanna and Buck Hill Falls quadrangles, Monroe County, Pennsylvania , W. D. Sevon. 1975. 2 pls., bedrock geol. map with text on reverse, surficial geol. map	12.00
A 204cd	Geology and mineral resources of the Pocono Pines and Mount Pocono quadrangles, Monroe County, Pennsylvania , T. M. Berg, W. D. Sevon, and M. F. Bucek. 1977. 66 p., 3 pls., bedrock geol. map, surficial geol. map	13.50
A 205a	Geology and mineral resources of the Brodheadsville quadrangle, Monroe and Carbon Counties, Pennsylvania , T. M. Berg. 1975. 60 p., 3 pls., bedrock geol. map, surficial geol. map	11.00
A 206	Allentown quadrangle—Mineral resources (Catasauqua, Nazareth, Allentown East, and Hellertown 7.5-minute quadrangles, Northampton, Lehigh, and Bucks Counties), B. L. Miller. 1925. 195 p., 15 pls., geol. and econ. geol. map, scale 1:62,500	*
A 214a	Geology and mineral resources of the Skytop quadrangle, Monroe and Pike Counties, Pennsylvania , W. D. Sevon and T. M. Berg. 1978. 33 p., 1 pl., geol. map	8.00
A 214c	Surficial geology of the East Stroudsburg 7½ minute quadrangle, Monroe County, Pennsylvania , M. F. Bucek. 1971; 2nd printing, 1974. 40 p., 1 pl., surficial geol. map	3.50
A 223	Geology and economic resources of the Pennsylvania portion of the Milford and Port Jervis 15-minute quadrangles (Shohola, Pond Eddy, Edgemere, Milford, Port Jervis North, and Port Jervis South 7.5-minute quadrangles, Pike County), F. W. Fletcher and D. L. Woodrow. 1970. 64 p., 2 pls., geol. map, scale 1:62,500	2.50

COUNTY REPORTS

(Map scale 1:62,500 unless otherwise indicated. County reports are numbered alphabetically within the Commonwealth.)

C 1, Pt. 1	Geology and mineral resources of Adams County, Pennsylvania , G. W. Stose. 1932. 153 p., 26 pls., geol. map, scale 1:125,000	*
C 1, Pt. 2	Mineral resources of Adams County, Pennsylvania , G. W. Stose. 1925. 64 p., 11 pls.	*
C 1, Pt. 3	Soil survey of Adams County, Pa. , A. L. Patrick and H. H. Bennett. 1924. 44 p., soils map	*
C 9	Geology and mineral resources of Bucks County, Pennsylvania , Bradford Willard, Jacob Freedman, D. B. McLaughlin, and others. 1959. 243 p., 24 pls., geol. map	*
C 26	Geology and mineral resources of Fayette County, Pennsylvania , W. O. Hickok IV and F. T. Moyer. 1940; 2nd printing, 1973. 530 p., 3 pls., geol. map ...	4.00
C 30	Geology and mineral resources of Greene County, Pennsylvania , R. W. Stone. 1932. 175 p., 3 pls., geol. map, scale approx. 1:125,000	*
C 39	Lehigh County, Pennsylvania , B. L. Miller, D. M. Fraser, R. L. Miller, and others. 1941. 492 p., 39 pls., geol. map	*
C 48	Northampton County, Pennsylvania , B. L. Miller, D. M. Fraser, and R. L. Miller. 1939; 3rd printing, 1973. 496 p., 29 pls., geol. map	*
C 52	Geology and mineral resources of Pike County, Pennsylvania , W. D. Sevon, T. M. Berg, L. D. Schultz, and G. H. Crowl. 1989. 141 p., 2 pls., bedrock geol. map, surficial geol. map, scale 1:50,000	21.00

C 56A	Geology and mineral resources of southern Somerset County, Pennsylvania , N. K. Flint. 1965; 3rd printing, 1981. 267 p., 13 pls., geol. map, coal reserve maps	8.00
C 67	Geology and mineral resources of York County, Pennsylvania , G. W. Stose and A. I. Jonas. 1939; 3rd printing, 1973. 199 p., 38 pls., geol. map	*

EDUCATIONAL SERIES

ES 1	Rocks and minerals of Pennsylvania , J. H. Barnes. 3rd ed., 1991; 2nd printing, revised, 1997. 30 p.	free
ES 2	Common fossils of Pennsylvania , D. M. Hoskins. 2nd ed., 1999. 19 p.	free
ES 3	The geology of Pennsylvania's groundwater , G. M. Fleeger. 3rd ed., 1999. 34 p.	free
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MAPS

(Maps 16–19, 21–26, 28–37, 40, 46–47, 50–58, and 60 are out of print and have been replaced by a new series of 7.5-minute oil and gas base maps (1:24,000 scale). For ordering and price information, please contact A. H. Mathias and Company, Inc., 950 Penn Avenue, Pittsburgh, PA 15222, telephone 412–281–1800. When ordering the maps, please provide the 7.5-minute topographic map name of each map desired. An index to the available maps may be obtained by contacting the Bureau of Topographic and Geologic Survey, Subsurface Geology Section, 400 Waterfront Drive, Pittsburgh, PA 15222–4745, telephone 412–442–4235, between 8:00 a.m. and 4:00 p.m. weekdays.)

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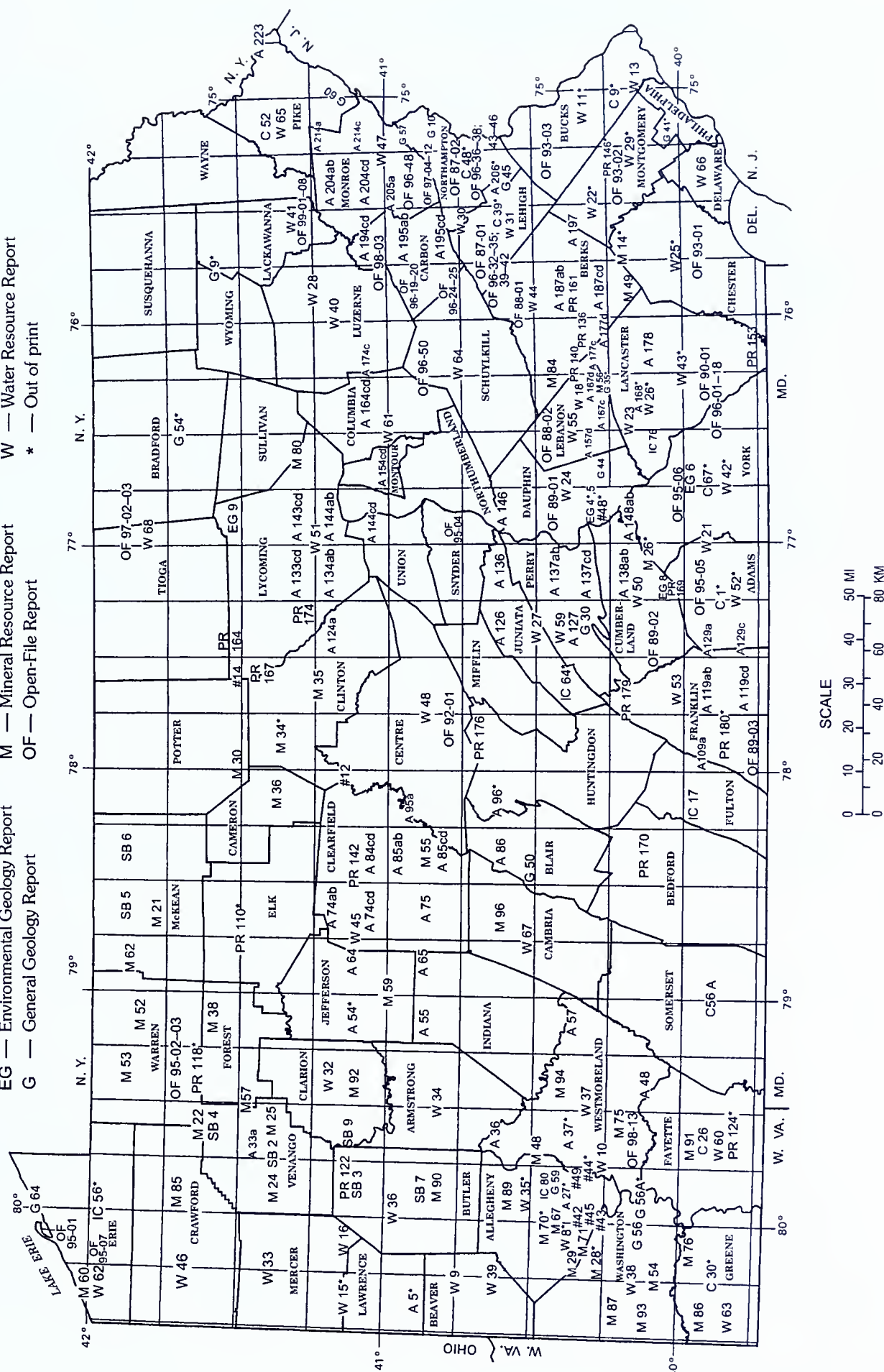
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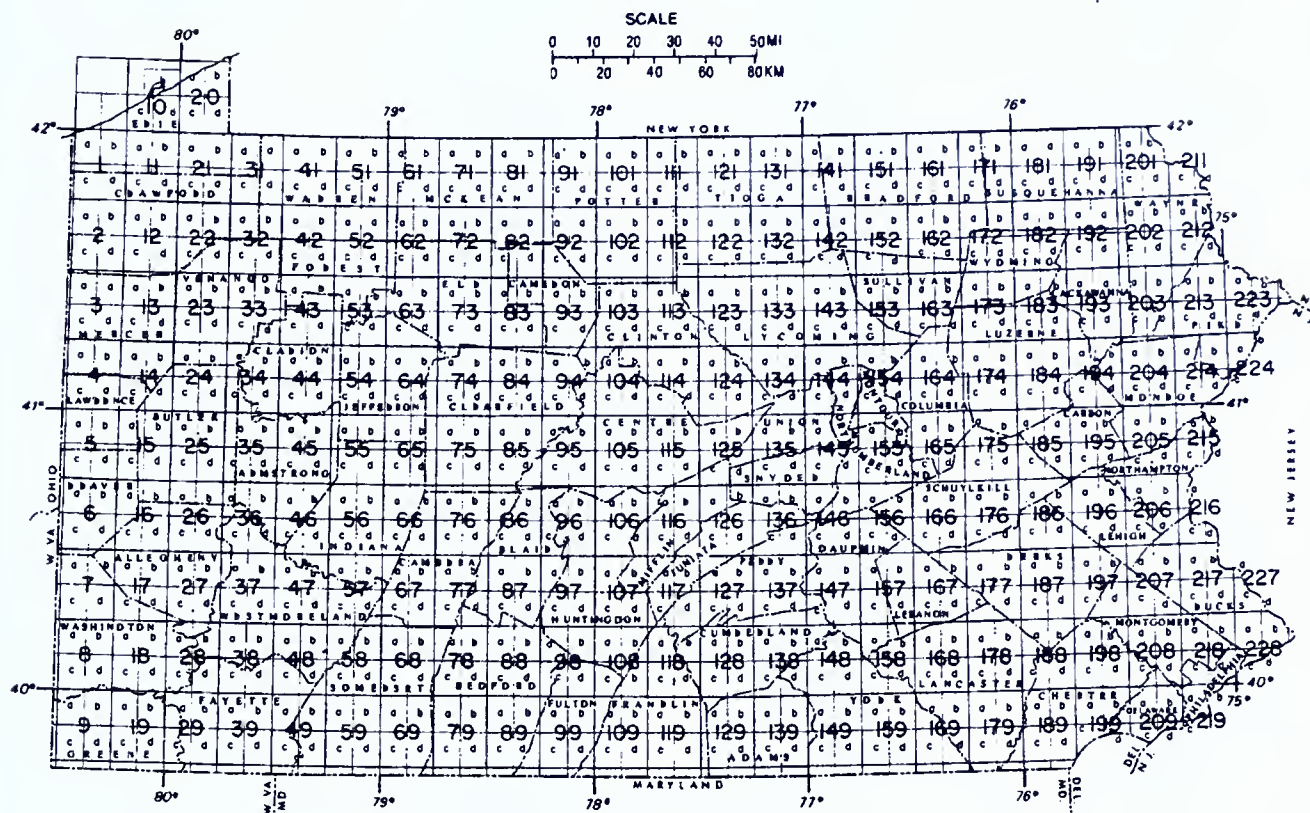
KEY TO AREAL REPORTS

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|----|--------------------------------|----|---------------------------|----|-------------------------|
| A | — Atlas Series | IC | — Information Circular | PR | — Progress Report |
| C | — County Report | # | — Map | SB | — Special Bulletin |
| EG | — Environmental Geology Report | M | — Mineral Resource Report | W | — Water Resource Report |
| G | — General Geology Report | OF | — Open-File Report | * | — Out of print |



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KEY TO QUADRANGLE NUMBERING SYSTEM



QUADRANGLE INDEX

The following list is to be used in conjunction with the index map above. The names of 15-minute quadrangles correspond to the numbered headings, and the associated 7.5-minute quadrangles correspond to the lettered headings. The index begins with the 15-minute quadrangle located in the upper left corner of the map.

- | | | | |
|---------------------|---------------------|-----------------------|-------------------|
| 1. Girard | 5. New Castle | 9. Rogersville | 13. Stoneboro |
| a. East Springfield | a. Bessemer | a. Wind Ridge | a. Hadley |
| b. Albion | b. New Castle South | b. Rogersville | b. New Lebanon |
| c. Beaver Center | c. New Galilee | c. New Freeport | c. Jackson Center |
| d. Corneautville | d. Beaver Falls | d. Holbrook | d. Sandy Lake |
| 2. Linesville | 6. Beaver | 10. Erie | 14. Mercer |
| a. Linesville | a. Midland | a-b. Erie North | a. Mercer |
| b. Harmonsburg | b. Beaver | c. Swanville | b. Grove City |
| c. Hartstown | c. Hookstown | d. Erie South | c. Harlansburg |
| d. Corneaut Lake | d. Aliquippa | 11. Cambridge Springs | d. Slippery Rock |
| 3. Shenango | 7. Burgettstown | a. Edinboro North | 15. Zelienople |
| a. Greenville West | a. Burgettstown | b. Cambridge Springs | a. Portersville |
| b. Greenville East | b. Clinton | NE | b. Prospect |
| c. Sharpsville | c. Avella | c. Edinboro South | c. Zelienople |
| d. Fredonia | d. Midway | d. Cambridge Springs | d. Evans City |
| 4. Neshannock | 8. Claysville | 12. Meadville | 16. Sewickley |
| a. Sharon East | a. West Middletown | a. Meadville | a. Baden |
| b. Greenfield | b. Washington West | b. Blooming Valley | b. Mars |
| c. Edinburg | c. Claysville | c. Geneva | c. Ambridge |
| d. New Castle North | d. Prosperity | d. Cochranon | d. Emsworth |

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|---|---|---|---|
| 17. Carnegie
a. Oakdale
b. Pittsburgh West
c. Canonsburg
d. Bridgeville | 31. Corry
a. Corry
b. Columbus
c. Spartansburg
d. Spring Creek | 45. Rural Valley
a. Templeton
b. Distant
c. Mosgrove
d. Rural Valley | 59. Meyersdale
a. Rockwood
b. Murdock
c. Markleton
d. Meyersdale |
| 18. Amity
a. Washington East
b. Hackett
c. Amity
d. Ellsworth | 32. Titusville
a. Titusville North
b. Grand Valley
c. Titusville South
d. Pleasantville | 46. Elders Ridge
a. Whitesburg
b. Elderton
c. Avonmore
d. McIntyre | 61. Kinzua
a. Cornplanter Run
b. Stickney
c. Cornplanter Bridge
d. Westline |
| 19. Waynesburg
a. Waynesburg
b. Mather
c. Oak Forest
d. Garards Fort | 33. Oil City
a. Oil City
b. President
c. Cranberry
d. Kossuth | 47. Latrobe
a. Saltsburg
b. Blairsville
c. Latrobe
d. Derry | 62. Kane
a. Ludlow
b. Kane
c. Russell City
d. James City |
| 20. North East
a. Harborcreek
b. North East
c. Hammett
d. Wattsburg | 34. Foxburg
a. Emlenton
b. Knox
c. Parker
d. Rimersburg | 48. Donegal
a. Mammoth
b. Stahlstown
c. Donegal
d. Seven Springs | 63. Hallton
a. Hallton
b. Portland Mills
c. Munderf
d. Carman |
| 21. Union City
a. Waterford
b. Union City
c. Millers Station
d. Lake Canadohta | 35. Kittanning
a. Chicora
b. East Brady
c. Worthington
d. Kittanning | 49. Confluence
a. Mill Run
b. Kingwood
c. Ohiopyle
d. Confluence | 64. Du Bois
a. Hazen
b. Falls Creek
c. Reynoldsville
d. Du Bois |
| 22. Townville
a. Townville
b. Centerville
c. Sugar Lake
d. Dempseytown | 36. Freeport
a. Freeport
b. Leechburg
c. New Kensington
d. Vandergrift | 51. Warren
a. Russell
b. Scandia
c. Warren
d. Clarendon | 65. Punxsutawney
a. Punxsutawney
b. McGees Mills
c. Rochester Mills
d. Burnside |
| 23. Franklin
a. Utica
b. Franklin
c. Polk
d. Kennerdell | 37. Greensburg
a. Murrysville
b. Slickville
c. Irwin
d. Greensburg | 52. Sheffield
a. Cherry Grove
b. Sheffield
c. Mayburg
d. Lynch | 66. Barnesboro
a. Commodore
b. Barnesboro
c. Strongstown
d. Colver |
| 24. Hilliards
a. Barkeyville
b. Eau Claire
c. West Sunbury
d. Hilliards | 38. Connellsville
a. Smithton
b. Mount Pleasant
c. Dawson
d. Connellsville | 53. Marienville
a. Marienville West
b. Marienville East
c. Cooksburg
d. Sigel | 67. Johnstown
a. Vintondale
b. Nanty Glo
c. Johnstown
d. Geistown |
| 25. Butler
a. Mount Chestnut
b. East Butler
c. Butler
d. Saxonburg | 39. Uniontown
a. Uniontown
b. South Connellsville
c. Brownfield
d. Fort Necessity | 54. Brookville
a. Corsica
b. Brookville
c. Summerville
d. Coolspring | 68. Windber
a. Hooversville
b. Windber
c. Stoystown
d. Central City |
| 26. New Kensington
a. Valencia
b. Curtisville
c. Glenshaw
d. New Kensington
West | 41. Youngsville
a. Lottsville
b. Sugar Grove
c. Pittsfield
d. Youngsville | 55. Smicksburg
a. Dayton
b. Valier
c. Plumville
d. Marion Center | 69. Berlin
a. Berlin
b. New Baltimore
c. Wittenberg
d. Fairhope |
| 27. Pittsburgh
a. Pittsburgh East
b. Braddock
c. Glassport
d. McKeesport | 42. Tidioute
a. Tidioute
b. Cobham
c. West Hickory
d. Kellettville | 56. Indiana
a. Ernest
b. Clymer
c. Indiana
d. Brush Valley | 71. Bradford
a. Bradford
b. Derrick City
c. Lewis Run
d. Cyclone |
| 28. Brownsville
a. Monongahela
b. Donora
c. California
d. Fayette City | 43. Tionesta
a. Tionesta
b. Tylersburg
c. Fryburg
d. Lucinda | 57. New Florence
a. Bolivar
b. New Florence
c. Wilpen
d. Rachelwood | 72. Mt. Jewett
a. Mt. Jewett
b. Hazel Hurst
c. Wilcox
d. Glen Hazel |
| 29. Masontown
a. Carmichaels
b. New Salem
c. Masontown
d. Smithfield | 44. Clarion
a. Clarion
b. Strattanville
c. Sligo
d. New Bethlehem | 58. Somerset
a. Ligonier
b. Boswell
c. Bakersville
d. Somerset | 73. Ridgway
a. Ridgway
b. Saint Marys
c. Brandy Camp
d. Kersey |

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|---|--|--|---|
| 74. Penfield
a. Sabula
b. Penfield
c. Luthersburg
d. Elliott Park | 88. Everett
a. New Enterprise
b. Hopewell
c. Everett West
d. Everett East | 103. Renovo West
a. Hammersley Fork
b. Tamarack
c. Keating
d. Renovo West | 117. East Waterford
a. McVeytown
b. McCoysville
c. Blairs Mills
d. Blain |
| 75. Curwensville
a. Mahaffey
b. Curwensville
c. Westover
d. Irvona | 89. Clearville
a. Clearville
b. Mench
c. Chaneysville
d. Amaranth | 104. Snow Shoe
a. Snow Shoe NW
b. Snow Shoe NE
c. Snow Shoe
d. Snow Shoe SE | 118. Shippensburg
a. Doylesburg
b. Newburg
c. Roxbury
d. Shippensburg |
| 76. Patton
a. Hastings
b. Coalport
c. Carrolltown
d. Ashville | 91. Coudersport
a. Shinglehouse
b. Oswayo
c. Roulette
d. Coudersport | 105. Bellefonte
a. Bear Knob
b. Bellefonte
c. Julian
d. State College | 119. Chambersburg
a. Chambersburg
b. Scotland
c. Greencastle
d. Waynesboro |
| 77. Ebensburg
a. Ebensburg
b. Cresson
c. Beaverdale
d. Blue Knob | 92. Emporium
a. Keating Summit
b. Austin
c. Emporium
d. Wharton | 106. Allensville
a. Pine Grove Mills
b. McAlevys Fort
c. Donation
d. Allensville | 121. Elkland
a. Knoxville
b. Elkland
c. Asaph
d. Keeneyville |
| 78. Bedford
a. Ogletown
b. Alum Bank
c. Schellsburg
d. Bedford | 93. Driftwood
a. Cameron
b. First Fork
c. Driftwood
d. Sinnemahoning | 107. Mt. Union
a. Mount Union
b. Newton Hamilton
c. Bulter Knob
d. Aughwick | 122. Antrim
a. Tiadaghton
b. Antrim
c. Cedar Run
d. Morris |
| 79. Hyndman
a. Buffalo Mills
b. Rainsburg
c. Hyndman
d. Beans Cove | 94. Karthaus
a. Devils Elbow
b. Pottersdale
c. Frenchville
d. Karthaus | 108. Orbisonia
a. Orbisonia
b. Shade Gap
c. Burnt Cabins
d. Fannettsburg | 123. Waterville
a. Cammal
b. English Center
c. Jersey Mills
d. Waterville |
| 81. Smethport
a. Eldred
b. Bullis Mills
c. Smethport
d. Port Allegany | 95. Philipsburg
a. Philipsburg
b. Black Moshannon
c. Sandy Ridge
d. Port Matilda | 109. Mercersburg
a. McConnellsburg
b. St. Thomas
c. Mercersburg
d. Williamson | 124. Lock Haven
a. Lock Haven
b. Jersey Shore
c. Mill Hall
d. Loganton |
| 82. Crosby
a. Crosby
b. Norwich
c. Wildwood Fire Tower
d. Rich Valley | 96. Tyrone
a. Tyrone
b. Franklinville
c. Spruce Creek
d. Alexandria | 111. Gaines
a. Harrison Valley
b. Potter Brook
c. West Pike
d. Sabinsville | 125. Millheim
a. Millheim
b. Woodward
c. Coburn
d. Weikert |
| 83. Benezette
a. Rathbun
b. West Creek
c. Weedville
d. Dents Run | 97. Huntingdon
a. Williamsburg
b. Huntingdon
c. Entrioken
d. Cassville | 112. Galetown
a. Galetown
b. Marshlands
c. Oleona
d. Lee Fire Tower | 126. Mifflintown
a. Alfarata
b. McClure
c. Mifflintown
d. Mexico |
| 84. Clearfield
a. Huntley
b. The Knobs
c. Clearfield
d. Leontes Mills | 98. Broad Top
a. Saxton
b. Saltillo
c. Wells Tannery
d. Hustontown | 113. Renovo East
a. Young Womans Creek
b. Slate Run
c. Renovo East
d. Glen Union | 127. Loysville
a. Spruce Hill
b. Ickesburg
c. Andersonburg
d. Landisburg |
| 85. Houtzdale
a. Glen Richey
b. Wallacetown
c. Ramey
d. Houtzdale | 99. Needmore
a. Breezewood
b. Meadow Grounds
c. Needmore
d. Big Cove Tannery | 114. Howard
a. Howard NW
b. Farrandsville
c. Howard
d. Beech Creek | 128. Newville
a. Newville
b. Plainfield
c. Walnut Bottom
d. Dickinson |
| 86. Altoona
a. Blandburg
b. Tipton
c. Altoona
d. Bellwood | 101. Genesee
a. Ellisburg
b. Ulysses
c. Sweden Valley
d. Brookland | 115. Centre Hall
a. Mingoville
b. Madisonburg
c. Centre Hall
d. Spring Mills | 129. Fairfield
a. Caledonia Park
b. Arendtsville
c. Iron Springs
d. Fairfield |
| 87. Hollidaysburg
a. Hollidaysburg
b. Frankstown
c. Roaring Spring
d. Martinsburg | 102. Conrad
a. Ayers Hill
b. Cherry Springs
c. Conrad
d. Short Run | 116. Lewistown
a. Barrville
b. Burnham
c. Belleville
d. Lewistown | 131. Tioga
a. Tioga
b. Jackson Summit
c. Crooked Creek
d. Mansfield |

- | | | | |
|---|--|---|--|
| 132. Blossburg
a. Cherry Flats
b. Blossburg
c. Nauvoo
d. Liberty | 146. Millersburg
a. Dalmatia
b. Pillow
c. Millersburg
d. Elizabethville | 161. Towanda
a. Litchfield
b. Windham
c. Towanda
d. Rome | 175. Mahanoy
a. Nuremberg
b. Conyngham
c. Shenandoah
d. Delano |
| 133. Trout Run
a. White Pine
b. Trout Run
c. Salladasburg
d. Cogan Station | 147. Harrisburg
a. Halifax
b. Enders
c. Harrisburg West
d. Harrisburg East | 162. Monroeton
a. Monroeton
b. Wyalusing
c. Dushore
d. Colley | 176. Pottsville
a. Pottsville
b. Orwigsburg
c. Friedensburg
d. Auburn |
| 134. Williamsport
a. Linden
b. Williamsport
c. Carroll
d. Williamsport SE | 148. New Cumberland
a. Lemoyne
b. Steelton
c. Wellsville
d. Dover | 163. Laporte
a. Laporte
b. Lopez
c. Elk Grove
d. Red Rock | 177. Wernersville
a. Strausstown
b. Bernville
c. Womelsdorf
d. Sinking Spring |
| 135. Mifflinburg
a. Hartleton
b. Mifflinburg
c. Beavertown
d. Middleburg | 149. Hanover
a. Abbottstown
b. West York
c. Hanover
d. Seven Valleys | 164. Bloomsburg
a. Benton
b. Stillwater
c. Bloomsburg
d. Mifflinville | 178. New Holland
a. Ephrata
b. Terre Hill
c. Leola
d. New Holland |
| 136. Millerstown
a. Beaver Springs
b. Richfield
c. Millerstown
d. Reward | 151. Sayre
a. Bentley Creek
b. Sayre
c. East Troy
d. Ulster | 165. Catawissa
a. Catawissa
b. Shumans
c. Mount Carmel
d. Ashland | 179. Quarryville
a. Quarryville
b. Gap
c. Wakefield
d. Kirkwood |
| 137. New Bloomfield
a. Newport
b. Duncannon
c. Shermans Dale
d. Wertzville | 152. Powell
a. Leroy
b. Powell
c. Shunk
d. Overton | 166. Pine Grove
a. Tremont
b. Minersville
c. Pine Grove
d. Swatara Hill | 181. Montrose
a. Laurel Lake
b. Franklin Forks
c. Montrose West
d. Montrose East |
| 138. Carlisle
a. Carlisle
b. Mechanicsburg
c. Mount Holly Springs
d. Dillsburg | 153. Eagles Mere
a. Hillsgrove
b. Eagles Mere
c. Picture Rocks
d. Sonestown | 167. Lebanon
a. Fredericksburg
b. Bethel
c. Lebanon
d. Richland | 182. Tunkhannock
a. Springville
b. Hop Bottom
c. Tunkhannock
d. Factoryville |
| 139. Gettysburg
a. Biglerville
b. Hampton
c. Gettysburg
d. McSherrystown | 154. Hughesville
a. Hughesville
b. Lairdsville
c. Washingtonville
d. Millville | 168. Lancaster
a. Manheim
b. Lititz
c. Columbia East
d. Lancaster | 183. Pittston
a. Center Moreland
b. Ransom
c. Kingston
d. Pittston |
| 141. Troy
a. Millerton
b. Gillett
c. Roseville
d. Troy | 155. Shamokin
a. Riverside
b. Danville
c. Trevorton
d. Shamokin | 169. McCalls Ferry
a. Safe Harbor
b. Conestoga
c. Airville
d. Holtwood | 184. Wilkes-Barre
a. Wilkes-Barre West
b. Wilkes-Barre East
c. Freeland
d. White Haven |
| 142. Canton
a. Gleason
b. Canton
c. Ralston
d. Grover | 156. Lykens
a. Klingerstown
b. Valley View
c. Lykens
d. Tower City | 171. Le Raysville
a. Little Meadows
b. Friendsville
c. Le Raysville
d. Lawton | 185. Hazleton
a. Hazleton
b. Weatherly
c. Tamaqua
d. Nesquehoning |
| 143. Warrensville
a. Bodines
b. Barbours
c. Montoursville North
d. Huntersville | 157. Hummelstown
a. Grantville
b. Indiantown Gap
c. Hershey
d. Palmyra | 172. Meshoppen
a. Laceyville
b. Auburn Center
c. Jenningsville
d. Meshoppen | 186. Hamburg
a. New Ringgold
b. New Tripoli
c. Hamburg
d. Kutztown |
| 144. Milton
a. Montoursville South
b. Muncy
c. Allenwood
d. Milton | 158. Middletown
a. Middletown
b. Elizabethtown
c. York Haven
d. Columbia West | 173. Harvey Lake
a. Dutch Mtn.
b. Noxen
c. Sweet Valley
d. Harveys Lake | 187. Reading
a. Temple
b. Fleetwood
c. Reading
d. Birdsboro |
| 145. Sunbury
a. Lewisburg
b. Northumberland
c. Freeburg
d. Sunbury | 159. York
a. York
b. Red Lion
c. Glen Rock
d. Stewartstown | 174. Shickshinny
a. Shickshinny
b. Nanticoke
c. Berwick
d. Sybertsville | 188. Honey Brook
a. Morgantown
b. Elverson
c. Honey Brook
d. Wagontown |

- | | | | |
|--|---|--|--|
| 189. Coatesville
a. Parkesburg
b. Coatesville
c. Oxford
d. West Grove | c. Boyertown
d. Sassamansville | c. Allentown East
d. Hellertown | 216. Easton
a. Easton
c. Riegelsville
d. Frenchtown |
| 191. Susquehanna
a. Great Bend
b. Susquehanna
c. Harford
d. Thompson | 198. Phoenixville
a. Pottstown
b. Phoenixville
c. Downingtown
d. Malvern | 207. Quakertown
a. Milford Square
b. Quakertown
c. Perkiomenville
d. Telford | 217. Doylestown
a. Bedminster
b. Lumberville
c. Doylestown
d. Buckingham |
| 192. Dundaff
a. Lenoxville
b. Clifford
c. Dalton
d. Carbondale | 199. West Chester
a. Unionville
b. West Chester
c. Kennett Square
d. Wilmington North | 208. Norristown
a. Collegeville
b. Lansdale
c. Valley Forge
d. Norristown | 218. Germantown
a. Ambler
b. Hatboro
c. Germantown
d. Frankford |
| 193. Scranton
a. Scranton
b. Olyphant
c. Avoca
d. Moscow | 201. Starrucca
a. Starrucca
b. Hancock
c. Orson
d. Lake Como | 209. Chester
a. Media
b. Lansdowne
c. Marcus Hook
d. Bridgeport | 219. Philadelphia
a. Philadelphia
b. Camden
c. Woodbury |
| 194. Stoddartsville
a. Pleasant View
Summit
b. Thornhurst
c. Hickory Run
d. Blakeslee | 202. Honesdale
a. Forest City
b. Aldenville
c. Waymart
d. Honesdale | 211. Long Eddy
c. Long Eddy
d. Callicoon | 223. Milford
a. Shohola
b. Pond Eddy
c. Edgemere
d. Milford |
| 195. Mauch Chunk
a. Christmans
b. Pohopoco
Mountain
c. Lehigh
d. Palmerton | 203. Ariel
a. Lake Ariel
b. Lakeville
c. Sterling
d. Newfoundland | 212. Damascus
a. Galilee
b. Damascus
c. White Mills
d. Narrowsburg | 224. Dingmans Ferry
a. Lake Maskenzha
b. Culvers Gap
c. Flatbrookville |
| 196. Alburtis
a. Slatedale
b. Cementon
c. Topton
d. Allentown West | 204. Pocono
a. Tobyhanna
b. Buck Hill Falls
c. Pocono Pines
d. Mount Pocono | 213. Hawley
a. Hawley
b. Rowland
c. Promised Land
d. Pecks Pond | 227. Lambertville
a. Stockton
c. Lambertville
d. Pennington |
| 197. Boyertown
a. Manatawny
b. East Greenville | 205. Wind Gap
a. Brodheads
b. Saylorsburg
c. Kunkletown
d. Wind Gap | 214. Bushkill
a. Skytop
b. Twelvemile Pond
c. East Stroudsburg
d. Bushkill | 228. Burlington
a. Langhorne
b. Trenton West
c. Beverly
d. Bristol |
| | 206. Allentown
a. Catasauqua
b. Nazareth | 215. Delaware Water Gap
a. Stroudsburg
b. Portland
c. Bangor
d. Belvidere | |

INDEX TO PUBLICATIONS ON PENNSYLVANIA

This index is designed to help you find the publications in which you are interested and is divided into two parts, a county index and a subject index. When you have found a publication series and number (e.g., A 27), refer to the list of publications to find the title of the publication. The title will help you decide if the publication contains the specific type of information you desire. Publications covering the whole state or large portions of the state, such as Map 1 and EG 1, are not listed in the county index. Do not order publications from this index; refer to the list of publications for series, number, and title.

Much additional information on Pennsylvania geology is available in publications not covered in this list. The reader is referred to Pennsylvania Geological Survey General Geology Reports 34, 42, 61, and 73 for a more comprehensive list of articles on Pennsylvania geology written before 1979.

Abbreviations used in this index are as follows:

Pennsylvania Third (Commission) Survey—Pa. Geol. Survey (3rd)

Pennsylvania Geological Survey, fourth series—Pa. Geol. Survey (4th)

A — Atlas Series	Map — Map
C — County Report	OF — Open-File Report
EG — Environmental Geology Report	PG — Park Guide
ES — Educational Series	PR — Progress Report
G — General Geology Report	SB — Special Bulletin
IC — Information Circular	W — Water Resource Report
M — Mineral Resource Report	

COUNTY INDEX

ADAMS

Pa. Geol. Survey (4th): A 129a, 129c; C 1; ES 5; G 2, 33, 40, 43, 65; IC 68, 70, 77; M 3, 11, 16, 23, 50, 51, 63; OF 95-05; PG 15; PR 169; W 2, 21, 42, 49, 52

ALLEGHENY

Pa. Geol. Survey (4th): A 27, 36, 37; G 2, 7, 12, 17, 33, 40, 56A, 59, 67; IC 16, 72, 80; Map 42, 45, 49; M 1, 2, 4, 5, 6, 11, 17, 19, 29, 31, 32, 48, 50(2B, 3), 51, 66-71, 77, 87, 89; OF 72-01, 98-13; PR 148; SB 1; W 1, 8, 10, 35

ARMSTRONG

Pa. Geol. Survey (4th): A 36, 54, 55; G 3, 40, 67; IC 16, 72, 80; Map 42, 43, 44, 49; M 1, 2, 4, 6, 10, 11, 17, 19, 31, 32, 39, 50, 51, 66-71, 74, 77; OF 72-01, 98-13; PR 148, 178; SB 9; W 3, 34

BEAVER

Pa. Geol. Survey (4th): A 5; G 7, 32, 40, 55; IC 16, 72, 80; Map 42, 43, 44, 49; M 1, 2, 4, 6, 17, 31, 32, 50(1, 2B, 4), 66, 67, 68, 70, 71, 77, 87; OF 72-01; PR 127, 148; SB 1; W 3, 9, 39

BEDFORD

Pa. Geol. Survey (4th): G 3, 19, 24, 33, 36, 38, 40, 47, 48, 49, 52, 58; IC 16, 72; M 4, 6(I, IV), 10, 23, 27, 31, 39, 50(1, 1S, 3, 4), 51, 66, 69, 72; PR 126, 170; W 5

BERKS

Pa. Geol. Survey (4th): A 177c, 177d, 178, 187ab, 187cd, 197; G 3, 14, 15, 31, 33, 37, 40, 43; IC 70, 77; M 3, 11, 18(B), 23, 43, 49, 50, 51, 63, 72, 84; OF 88-01,

96-32, 96-33, 96-39, 96-40, 96-41, 96-42; PG 6; PR 136, 140, 161; W 2, 22, 44, 49

BLAIR

Pa. Geol. Survey (4th): A 86, 96; G 3, 12, 19, 33, 36, 38, 40, 47, 48, 50, 52, 53, 58; IC 60, 72; M 2, 4, 5, 6, 11, 23, 50, 51, 66, 72, 96; PR 126; W 5

BRADFORD

Pa. Geol. Survey (4th): EG 9; G 4, 19, 40, 54; IC 16, 66, 72; M 5, 6(I, III, IV), 27, 31, 39, 40, 43, 50(3); PR 138; W 6, 68

BUCKS

Pa. Geol. Survey (4th): A 206; C 9; G 3, 16, 28, 40, 43, 65; IC 77; Map 8; M 3, 5, 11, 18(C), 43, 50, 51, 63, 72; OF 93-03, 96-43, 96-44, 96-45, 96-46; PG 14; W 2, 11, 13, 14

BUTLER

Pa. Geol. Survey (4th): A 36; G 7, 32, 33, 40, 55, 67; IC 16, 72, 80; Map 42, 43, 44, 49; M 1, 2, 4, 6, 11, 17, 19, 31, 32, 39, 40, 50(1, 1S, 3, 4), 51, 66-71, 74, 77, 90; OF 72-01; PG 4; PR 122, 127, 148; SB 3, 7, 9; W 1, 16, 36

CAMBRIA

Pa. Geol. Survey (4th): A 57, 86; G 12, 39, 40; IC 72, 84; M 1, 4, 6, 10, 11, 23, 50(2B), 66, 68, 69, 74, 96; W 5, 67

CAMERON

Pa. Geol. Survey (4th): G 4, 19, 40; IC 16; M 6 (I, III, IV), 10, 11, 23, 31, 36, 39, 40; PR 109, 126, 138; W 6

96-05, 96-06, 96-09, 96-10, 96-11, 96-12, 96-16,
96-17, 96-18; PR 153; W 2, 26, 43, 49

LAWRENCE

Pa. Geol. Survey (4th): A 5; G 7, 32, 40, 55, 67; IC 16,
72; M 1, 2, 4, 6, 17, 31, 32, 50(1, 1S, 2B, 4), 51, 66,
69, 74, 77; PG 9; PR 127; W 3, 15, 16

LEBANON

Pa. Geol. Survey (4th): A 157d, 167c, 167d, 168, 177c;
G 3, 19, 31, 33, 35, 37, 39, 40, 43, 51; IC 68, 70, 72,
77; M 3, 5, 8, 11, 16, 18(B), 50(1, 1S, 3, 4), 51, 56,
63; OF 88-02; PG 16; PR 130, 140; W 2, 4, 18, 26,
49, 55, 64

LEHIGH

Pa. Geol. Survey (4th): A 195cd, 197, 206; C 39; G 7, 16,
31, 33, 37, 40, 43, 45; IC 77; Map 39; M 3, 5, 11, 16,
27, 50(1, 1S, 3), 51, 63, 72; OF 87-01, 96-32, 96-33,
96-34, 96-35, 96-36, 96-40, 96-41, 96-42, 96-43,
96-44, 97-06; W 2, 30, 31

LUZERNE

Pa. Geol. Survey (4th): A 174c, 194cd; EG 9; G 9, 19, 26,
39, 40, 51, 63, 71; IC 16, 65, 72; M 2, 8, 10, 12, 39,
50(2B, 3), 51, 78; OF 96-19, 96-20, 98-03, 99-06,
99-08; PG 13; PR 130; W 4, 28, 40, 61, 64

LYCOMING

Pa. Geol. Survey (4th): A 124a, 133cd, 134ab, 143cd,
144ab; EG 9; G 2, 3, 7, 19, 33, 39, 40, 49, 53, 71;
IC 16, 72; Map 14; M 2, 3, 5, 6(II, III, IV), 11, 23, 27,
35, 39, 43, 45, 50(1, 1S, 3, 4), 51, 66, 72, 74, 80;
PR 138, 164, 167, 174; W 6, 51

McKEAN

Pa. Geol. Survey (4th): G 19, 40, 71; IC 16, 72; Map 5;
M 1, 6(I, III, IV), 11, 18(C), 19, 21, 23, 31, 32, 39, 40,
50(2B), 62, 66; PR 111, 125, 131, 138, 148, 178;
SB 5, 6; W 6

MERCER

Pa. Geol. Survey (4th): G 32, 40, 49, 55, 67; IC 16, 62,
72; M 1, 2, 4, 6, 11, 31, 32, 39, 50(4), 66, 69, 74;
PR 127, 148, 178; W 3, 15, 16, 33

MIFFLIN

Pa. Geol. Survey (4th): A 126; G 3, 12, 19, 29, 36, 38,
39, 40, 48, 52, 53, 58; M 3, 11, 18(B), 50(1S, 4); W 5,
27

MONROE

Pa. Geol. Survey (4th): A 194cd, 204ab, 204cd, 214a,
214c; G 3, 4, 10, 11, 19, 39, 40, 51, 57, 60, 71; IC 65,
70; M 3, 5, 23, 50(1, 1S, 3), 51, 63; OF 97-05, 97-07,
97-08, 97-09, 99-07; W 4, 47

MONTGOMERY

Pa. Geol. Survey (4th): A 197; G 3, 12, 33, 43, 65; IC 70,
77; M 3, 5, 13, 50, 51, 63, 72; OF 93-02; PG 8; PR 146;
W 2, 14, 22, 29

MONTOUR

Pa. Geol. Survey (4th): A 144ab, 154cd; EG 9; G 3, 7, 19,
40; IC 60; M 11, 50(1, 1S, 3, 4); W 4, 61

NORTHAMPTON

Pa. Geol. Survey (4th): A 195ab, 195cd, 206; C 48; G 7, 10,
11, 16, 31, 33, 37, 39, 40, 45, 57, 70; IC 70, 77; M 3,
5, 9, 16, 23, 50(1, 1S, 3), 51, 63, 64, 72; OF 87-02,
96-35, 96-36, 96-37, 96-38, 96-43, 96-44, 96-45,
97-07, 97-08, 97-09, 97-10, 97-11, 97-12; W 2, 30

NORTHUMBERLAND

Pa. Geol. Survey (4th): A 144ab, 144cd, 146, 154cd; EG 9;
G 3, 4, 7, 13, 19, 23, 39, 40, 51, 71; IC 16, 72; M 5,
8, 11, 12, 23, 39, 43, 50, 51, 72, 78; PR 130; W 4,
61, 64

PERRY

Pa. Geol. Survey (4th): A 126, 127, 136, 137ab, 137cd,
146; G 3, 4, 8, 12, 19, 29, 30, 33, 36, 39, 40, 48, 51,
62, 70; IC 68; M 3, 50(1S, 3, 4), 51; W 5, 27, 59

PHILADELPHIA

Pa. Geol. Survey (4th): G 12, 41, 43, 65; IC 70; M 5, 27,
50(3); W 2, 13

PIKE

Pa. Geol. Survey (4th): A 204ab, 214a, 223; C 52; G 4,
19, 39, 40, 51, 60, 63; IC 16, 65; M 5, 23, 50(3), 51;
OF 99-02; PG 18; W 4, 65

POTTER

Pa. Geol. Survey (4th): EG 9; G 4, 19, 40, 71; IC 16;
Map 14, 36, 47; M 1, 6(II), 18(C), 19, 23, 30, 31, 32,
36, 39, 40; PR 106, 117, 138, 148, 167; W 6, 68

SCHUYLKILL

Pa. Geol. Survey (4th): G 14, 19, 39, 40, 51, 62; IC 72;
M 3, 5, 8, 12, 50, 51, 63, 64, 78; OF 96-19, 96-24,
96-25, 96-32, 96-33; PG 16; PR 130; W 4, 18, 64

SNYDER

Pa. Geol. Survey (4th): A 126, 136, 146; G 3, 19, 33, 36,
39, 40, 48, 51, 62, 70; IC 16; M 3, 18(B), 50(1, 1S, 4);
OF 95-04; W 5, 27

SOMERSET

Pa. Geol. Survey (4th): A 48, 57; C 56A; G 19, 24, 39,
40, 67; IC 16, 72; M 4, 6, 10, 23, 31, 39, 59(1, 1S,
2B), 51, 66, 68, 69, 74, 77; W 5

SULLIVAN

Pa. Geol. Survey (4th): EG 9; G 7, 19, 33, 39, 40, 71;
IC 16, 66, 72; M 2, 5, 27, 39, 43, 50(3), 66, 72, 80;
PG 12, 13; PR 130, 138; W 6

SUSQUEHANNA

Pa. Geol. Survey (4th): EG 9; G 4, 19, 39, 40, 63; IC 16,
65, 66, 72; M 18(C), 27, 51; PR 130, 138; W 4

TIOGA

Pa. Geol. Survey (4th): EG 9; G 4, 19, 39, 40, 71; IC 16,
66, 72; Map 14; M 1, 2, 4, 6, 18(C), 27, 31, 32, 39, 40,
66, 74; PG 5; PR 107, 117, 138, 148, 164; W 6, 68

UNION

Pa. Geol. Survey (4th): A 144ab, 144cd; EG 9; G 3, 19,
33, 36, 40, 49; IC 16; M 5, 18(B), 39, 50(2B, 3, 4), 51,
72; PG 19; W 5

VENANGO

Pa. Geol. Survey (4th): A 33a; G 7, 32, 33, 40, 55, 67;
IC 72; M 1, 4, 6(l), 11, 19, 22–25, 27, 31, 32, 57, 66,
69, 74; PG 22; PR 122, 148; SB 2, 3, 4, 9; W 3

WARREN

Pa. Geol. Survey (4th): G 7, 19, 32, 40, 49, 55; IC 16;
Map 4, 5, 6; M 1, 6(l), 18(C), 19, 22, 23, 31, 32, 38,
39, 40, 52, 53, 57, 62; OF 95–02, 95–03; PR 118, 148;
SB 4; W 3

WASHINGTON

Pa. Geol. Survey (4th): A 27; G 39, 40, 56, 56A; IC 16, 72,
80, 84; Map 42–45, 49; M 1, 2, 4, 6, 17, 18(C), 19, 28,
29, 31, 32, 39, 50(1, 1S), 51, 54, 66–71, 74, 77, 87,
93; OF 72–01, 98–13; PR 127, 148; SB 1; W 1, 38

WAYNE

Pa. Geol. Survey (4th): A 204ab; G 4, 7, 19, 39, 40, 63;
IC 16, 65, 72; M 23, 43, 51; OF 99–01, 99–02, 99–03;
PG 18; PR 130; W 4

WESTMORELAND

Pa. Geol. Survey (4th): A 27, 36, 37, 48, 57; G 3, 12, 17,
33, 39, 40, 67; IC 16, 72, 80, 94; Map 42–45, 49; M 1,
2, 4, 6, 10, 11, 17, 18(B), 19, 31, 39, 48, 50(1, 1S, 3),
51, 66–71, 74, 75, 77; OF 72–01, 98–13; W 1, 37

WYOMING

Pa. Geol. Survey (4th): EG 9; G 7, 19, 39, 40, 63; IC 16, 66;
M 10, 27, 39, 43, 50(3); PR 138; W 4

YORK

Pa. Geol. Survey (4th): A 138ab, 148ab; C 67; EG 4, 6; G 2,
3, 7, 33, 40, 43, 46, 65; IC 68, 70, 77; Map 48; M 3,
5, 11, 16, 18(B), 27, 50, 51, 63, 72; OF 95–06, 96–01,
96–02, 96–03, 96–07, 96–08, 96–09, 96–10, 96–13,
96–14, 96–15, 96–16, 96–17; PG 10, 17; W 2, 21,
42, 49

SUBJECT INDEX

AGGREGATES, *see* **Limestone, Sand, Sandstone**, and
Atlas Series pertaining to area of interest

ALUMINUM (High-Alumina Clays and Shales)

Pa. Geol. Survey (4th): A 65, 74ab, 74cd, 75, 84cd, 85ab,
85cd, 95a; C 26, 56A; G 1; IC 54; Map 12; M 10, 13,
16, 17, 23, 50(2B), 51, 77, 79; PR 40, 45, 112

ANTHRACITE, *see* **Coal**

ASBESTOS

Pa. Geol. Survey (4th): C 1; G 1, 33; M 18

BARITE

Pa. Geol. Survey (4th): A 96; C 9; G 1, 33; IC 17, 54; M 5,
18, 72, 84

BITUMINOUS COAL, *see* **Coal**

BRINE, *see* **Salt**

CEMENT MATERIALS

Pa. Geol. Survey (3rd): 5
Pa. Geol. Survey (4th): A 187ab, 206; C 39, 48, 67; EG 6;
G 1, 45; IC 54; M 20, 50(1); OF 97–04

CHROMIUM

Pa. Geol. Survey (4th): IC 14; M 50(3); PR 153

CLAYS (Construction Clays and Shales)

Pa. Geol. Survey (3rd): 4, 8(C)
Pa. Geol. Survey (4th): (*see* Atlas Series pertaining to area
of interest); C 1, 26, 30, 52, 56A, 67; EG 8; G 1, 71;
IC 54, 67; M 17, 23, 51, 63, 71, 77, 79; OF 97–04;
PR 40, 45, 112, 169

COAL (Anthracite)

Pa. Geol. Survey (4th): A 164cd, 174c, 187ab; ES 7; G 1,
14, 72, 74; IC 72, 88; Map 2, 11; M 2, 8, 12, 44, 78;
PG 17; PR 130; W 64

COAL (Bituminous)

Pa. Geol. Survey (3rd): 1, 3, 10

Pa. Geol. Survey (4th): A 5, 27, 33a, 36, 37, 48, 54, 55,
57, 64, 65, 74ab, 74cd, 75, 84cd, 85ab, 85cd, 86,
95a, 124a, 133cd, 143cd; C 30, 56A; ES 7; G 1, 12,
17, 24, 50, 56, 56A, 59; IC 61, 72, 88; Map 2, 11, 42,
45, 49; M 2, 4, 6, 34, 35, 36, 42, 44, 48, 55, 57, 66, 68,
69, 74, 75, 76, 84, 86, 89–94, 96, 98; OF 95–09; PR 122,
159; W 15, 16, 33, 46, 60, 63

COBALT

Pa. Geol. Survey (4th): M 50(3), 56

COPPER

Pa. Geol. Survey (3rd): Biennial Report 1913–14
Pa. Geol. Survey (4th): A 127, 129a; C 1, 9, 48; G 33;
M 50(3), 56, 80

CRUSHED STONE, *see* **Limestone, Sand, Sandstone**,
and Atlas Series pertaining to area of interest

DIMENSION STONE

Pa. Geol. Survey (3rd): 8(E)
Pa. Geol. Survey (4th): (*see* Atlas Series pertaining to area
of interest); C 1, 48, 52, 67; EG 1, 5, 8; IC 54, 66; M 15,
16, 20; OF 97–04; PR 7, 72

DOLOMITE, *see* **Limestone**

EARTHQUAKES, *see* **Geologic Hazards**

FELDSPAR

Pa. Geol. Survey (4th): G 1; M 13, 18(C)

FLAGSTONE, *see* **Dimension Stone**

FOSSILS (For Collectors)

Pa. Geol. Survey (4th): A 64, 133cd, 136, 144ab; C 56A; ES 2, 7; G 3, 4, 17, 19, 30, 36, 38, 40, 47, 48, 52, 59, 72; PG 16

GANISTER

Pa. Geol. Survey (4th): A 86, 96; G 1; IC 54; M 3, 64, 88

GEOLOGIC HAZARDS (Earthquakes, Landslides, Sink-holes, Subsidence)

Pa. Geol. Survey (4th): A 86; C 39, 48; EG 2, 4, 6, 9; ES 9, 10, 11; G 56, 59; IC 75, 84; Map 45, 49; M 20; OF 87-01, 87-02, 88-01, 88-02, 89-01, 89-02, 89-03, 90-01, 92-01, 93-01, 93-02, 93-03, 95-05, 95-06

GLASS SAND

Pa. Geol. Survey (3rd): 12

Pa. Geol. Survey (4th): C 30; G 1; IC 54; M 3, 88; OF 97-04

GOLD

Pa. Geol. Survey (4th): M 50(3), 56; PR 77

GRANITE, *see* **Dimension Stone**

GRAPHITE

Pa. Geol. Survey (3rd): 6

Pa. Geol. Survey (4th): A 206; C 9, 39

GROUNDWATER

Pa. Geol. Survey (4th): A 27, 54, 86, 95a, 195cd, 206; C 26, 30, 48, 56A; EG 2, 4, 6, 8; ES 3; IC 7; Map 20; M 47; OF 95-01; PG 19; PR 146; W 1-68

HIGH-ALUMINA CLAYS AND SHALES, *see* **Aluminum**

HIGH-CALCIUM LIMESTONE

Pa. Geol. Survey (4th): A 86, 154cd; C 1, 67; G 31, 53; IC 54, 76; M 20, 50(4), 83; OF 97-04; PR 140

IRON ORE

Pa. Geol. Survey (4th): A 36, 48, 54, 55, 57, 65, 86, 95a, 96, 109a, 127, 129a, 133cd, 134ab, 136, 138ab, 157d, 167c, 168, 177d, 187ab, 206; C 1, 9, 26, 39, 48, 67; EG 8; G 1; M 14, 18(B), 26, 49, 56; PG 6, 15

KAOLIN, *see also* **Aluminum**

Pa. Geol. Survey (4th): G 33; PR 112

KARST TOPOGRAPHY

Pa. Geol. Survey (4th): A 154cd; C 39, 48; EG 6; ES 11; G 65; PG 8; OF 87-01, 87-02, 88-01, 88-02, 89-01, 89-02, 89-03, 90-01, 92-01, 93-01, 93-02, 93-03, 95-05, 95-06

LANDSLIDES, *see* **Geologic Hazards**

LEAD, *see* **Zinc**

LIMESTONE (Dolomite, Marble), *see also* **High-Calcium Limestone**

Pa. Geol. Survey (4th): (see Atlas Series pertaining to area of interest); C 1, 9, 26, 30, 39, 48, 56A, 67; EG 1, 6; ES 11; G 1, 22, 26, 31, 37, 38, 44, 45, 47, 49, 52, 53, 56, 56A, 58; IC 54, 60, 76; Map 15; M 15, 20, 50(1, 4), 67, 83; OF 97-04; PR 136, 140, 170, 171, 179, 180; W 1, 2, 5, 6, 7, 11, 15, 16, 18, 25, 26, 27, 29, 31, 32, 50, 53

MAGNESITE

Pa. Geol. Survey (4th): M 18(C); PR 28

MANGANESE

Pa. Geol. Survey (4th): A 138ab; C 1, 39, 48; G 33; M 26, 27; PR 128

MARBLE, *see* **Limestone**

MICA

Pa. Geol. Survey (4th): A 177c, 206; G 1

MINERAL PIGMENTS (Mineral Paint)

Pa. Geol. Survey (3rd): 4

Pa. Geol. Survey (4th): A 206; C 9, 39, 48; M 83

MINERALS (For Collectors)

Pa. Geol. Survey (3rd): 6, 9

Pa. Geol. Survey (4th): A 129c; C 39, 48; EG 8; ES 1; G 2, 33, 35; IC 13, 14, 17, 64; Map 7; M 5, 14, 18, 26, 27, 43, 50(3), 56, 72, 78, 80

MOLYBDENUM

Pa. Geol. Survey (3rd): 5, 9

Pa. Geol. Survey (4th): G 33; M 50(3)

NATURAL GAS, *see also* **Oil and Gas**

Pa. Geol. Survey (4th): A 36, 48, 54, 55, 57, 64, 65, 74ab, 74cd, 75, 84cd, 85ab, 85cd, 86, 95a, 124a, 133cd, 134ab, 136, 144ab, 223; C 26, 56A; IC 3; Map 9; M 30, 31, 34, 39, 46, 59, 60, 73, 81, 82, 84; OF 81-01, 95-09, 98-13; PR 107, 109, 110, 111, 117, 124, 133; SB 10, 11

NICKEL

Pa. Geol. Survey (3rd): 8, 9

Pa. Geol. Survey (4th): G 33; M 5, 50(3), 56

OIL AND GAS, *see also* **Natural Gas, Petroleum**

Pa. Geol. Survey (4th): A 5, 27, 37, 86; C 30, 52; ES 8; G 17, 21, 22, 34, 39, 42, 59, 61; IC 16, 80; Map 3-6, 10, 44, 62 (also see listing under Maps for oil and gas base maps produced by the Survey but sold by a private company); M 1, 2, 19, 23, 24, 25, 28, 37, 38, 40, 45, 47, 52, 53, 54, 62, 65, 85, 87; OF 81-01; PR 106, 114, 118, 122, 129, 135, 139, 143, 144, 147, 150, 151, 154, 155, 157, 158, 160, 165, 166, 168, 172, 173, 175, 177, 178, 181, 183, 184, 186-205; SB 2-9

PEAT

Pa. Geol. Survey (4th): A 194cd, 204ab, 204cd, 206, 214a, 214c, 223; C 48, 52; G 57, 71; IC 54, 65

PETROLEUM, see also **Oil and Gas**

Pa. Geol. Survey (4th): M 21, 22, 29, 32, 33, 41, 57, 70;
PR 116, 123, 125, 131, 148; SB 1

PYRITE

Pa. Geol. Survey (3rd): 9, 11
Pa. Geol. Survey (4th): A 206; C 39; G 1, 33; M 50(3), 56

PYROPHYLLITE

Pa. Geol. Survey (4th): PR 169

QUARTZ (Flint, Vein)

Pa. Geol. Survey (4th): C 1, 67; EG 8; G 33; M 18(C), 88;
PR 169

ROOFING GRANULES

Pa. Geol. Survey (4th): C 1, 67; IC 54; OF 97-04; PR 82

SALT (Brine)

Pa. Geol. Survey (4th): G 1; M 18, 47, 58; OF 73-02;
PR 95, 145

SAND (Sand and Gravel, Molding Sand)

Pa. Geol. Survey (4th): (see Atlas Series pertaining to area
of interest); C 1, 9, 26, 30, 39, 48, 52; EG 6; G 1, 7, 10,
23, 32, 54, 57, 60, 64, 71; IC 54, 86; Map 59; M 11,
64, 67; OF 97-04

SANDSTONE

Pa. Geol. Survey (4th): (see Atlas Series pertaining to area
of interest); C 1, 9, 26, 30, 39, 48, 52, 56A; EG 8; G 1,
54, 63; IC 54; M 3, 15, 67, 81; OF 97-04

SERPENTINE

Pa. Geol. Survey (3rd): 5
Pa. Geol. Survey (4th): C 48; G 46; IC 13, 14, 54; M 15;
OF 97-04; PR 153; W 2, 25

SHALE, see **Aluminum, Clays****SILVER**

Pa. Geol. Survey (3rd): 9
Pa. Geol. Survey (4th): G 33; M 5, 50(3), 56, 72

SINKHOLES, see **Geologic Hazards, Karst Topography****SLATE**

Pa. Geol. Survey (4th): A 195cd, 206; C 1, 39, 48, 67; G 1,
45; IC 2, 54; M 15, 16, 51, 63; OF 97-04

STONE, see **Aggregates, Dimension Stone, Ganister,
Glass Sand****SUBSIDENCE**, see **Geologic Hazards****TALC**

Pa. Geol. Survey (3rd): 5
Pa. Geol. Survey (4th): C 48; G 1, 33; OF 97-04

THORIUM

Pa. Geol. Survey (4th): G 33

URANIUM

Pa. Geol. Survey (3rd): 9
Pa. Geol. Survey (4th): A 86, 174c, 195ab, 195cd; G 33;
M 43, 80

VANADIUM

Pa. Geol. Survey (3rd): 9
Pa. Geol. Survey (4th): M 43

VERMICULITE

Pa. Geol. Survey (4th): M 18

WATER RESOURCES

Pa. Geol. Survey (4th): A 27, 54, 86, 95a, 195cd, 206;
C 26, 30, 48, 56A; EG 2, 4, 6, 8; ES 3; G 59; IC 7, 56;
Map 20; M 47; OF 95-01; PG 17, 19; PR 146; W 1-68

ZINC

Pa. Geol. Survey (3rd): Biennial Report 1910-1912
Pa. Geol. Survey (4th): A 86, 96, 144ab, 168, 187ab,
206; C 9, 26, 39; G 33; M 5, 50(3), 72

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